

Introduction to OpenCV

Part2. Python

April 17, 2013

Installation

How to install/ use (compile and run opencv) under different platforms,

`http://docs.opencv.org/doc/tutorials/introduction/
table_of_content_introduction/table_of_content_
introduction.html#table-of-content-introduction`

Tutorials

- ▶ To find opencv function:

<http://docs.opencv.org/index.html>

<http://code.opencv.org/projects/opencv/wiki>

- ▶ Some examples:

<C://opencv/samples/python>

- ▶ OpenCV(v2.1) + Python:

<http://opencv.willowgarage.com/documentation/python/introduction.html>

- ▶ OpenCV(v2.2) + Python:

[http:](http://opencv.willowgarage.com/wiki/PythonInterface)

[//opencv.willowgarage.com/wiki/PythonInterface](http://opencv.willowgarage.com/wiki/PythonInterface)

http://opencv.jp/opencv-2svn_org/py/

News

Some highlights of the new bindings:

- ▶ single import of all of OpenCV using `import cv`
- ▶ OpenCV functions no longer have the `cv` prefix
- ▶ simple types like `CvRect` and `CvScalar` use Python tuples
- ▶ sharing of Image storage, so image transport between OpenCV and other systems (e.g. `numpy` and `ROS`) is very efficient
- ▶ complete documentation for the Python functions
- ▶ Starting with OpenCV release 2.2, OpenCV will have completed it's new Python interface to cover all the C and C++ functions directly using `numpy` arrays. (The previous Python interface is called `SwigPythonInterface`.)
- ▶ new 'cv2' interface. The new `cv2` interface for Python integrates `numpy` arrays into the OpenCV framework, which makes operations much simpler as they are.

Lates OpenCV

- ▶ cv - old:
All OpenCV data types are preserved as such. For example, when loaded, images are of format cvMat, same as in C++
- ▶ opencv (v 2.2) - old = cv + cv2
- ▶ opencv (v 2.3) - new = cv2, where cv is subset of cv2
Everything is returned as Numpy objects like ndarray and native Python objects like lists,tuples,dictionary etc.
- ▶ Make sure operation are proper for images:
<http://opencvpython.blogspot.in/2012/06/difference-between-matrix-arithmetic-in.html>
- ▶ Installing cv2 latest version:
<http://opencvpython.blogspot.in/2012/05/install-opencv-in-windows-for-python.html>

Example

`http://opencvpython.blogspot.se`

`http://sajjad.in/content/ALPR_paper.pdf`

`http://glowingpython.blogspot.se/2011/10/`

`beginning-with-opencv-in-python.html` `http:`

`//www.neuroforge.co.uk/index.php/using-colour-images`

Example 1. Save Image

```
import cv
capture = cv.CaptureFromCAM(0)
frame = cv.QueryFrame(capture)
cv.SaveImage("capture.jpg", frame)
```

Example 2. Save Sequence of Images

Example 2. Save Sequence of Images

```
import cv
```

Example 2. Save Sequence of Images

```
import cv
capture = cv.CaptureFromCAM(-1)
cv.NamedWindow("capture", cv.CV_WINDOW_AUTOSIZE)
```

Example 2. Save Sequence of Images

```
import cv
capture = cv.CaptureFromCAM(-1)
cv.NamedWindow("capture", cv.CV_WINDOW_AUTOSIZE)
i = 0
while True:
    frame = cv.QueryFrame(capture)
    cv.ShowImage("capture", frame)
    cv.WaitKey(27)
    path = "capture" + str(i) + ".jpg"
    cv.SaveImage(path, frame)
    i += 1
```

Conversion

to PIL:

```
pil_img = Image.fromstring("L", cv.GetSize(frame), frame.tostring())
```

and back:

```
cv_img = cv.CreateImageHeader(pil_img.size, cv.IPL_DEPTH_8U, 3)  
cv.SetData(cv_img, pil_img.tostring())
```

numpy ↔ OpenCV

Numpy and OpenCV have different orderings for dimensions, hence the tuple reversal is needed:

<http://opencv.willowgarage.com/wiki/PythonInterface>

Image Information to Remember:

- ▶ images are read from file as 8-bit unsigned integers. In order to do complicated math operations, convert to 32-bit floating point type. Then convert back to write to file.
- ▶ rows is your y coordinate and that cols is your x coordinate. Size objects are called X,Y while images are referenced row, col.

PyVision= PIL + SciPy+ Python + OpenCV?

<http://www.scribd.com/doc/103041045/>

WACV2012-Tutorial-Introduction-to-PyVision-for-Computer-Vi